

KOREA ELECTRONICS CO.,LTD.

SEMICONDUCTOR
TECHNICAL DATA

KIA324P/F
BIPOLAR LINEAR INTEGRATED CIRCUIT

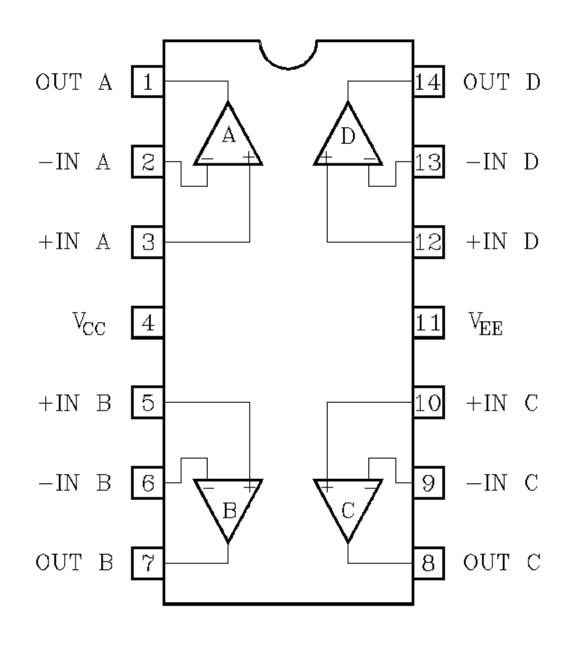
QUAD OPERATIONAL AMPLIFIER

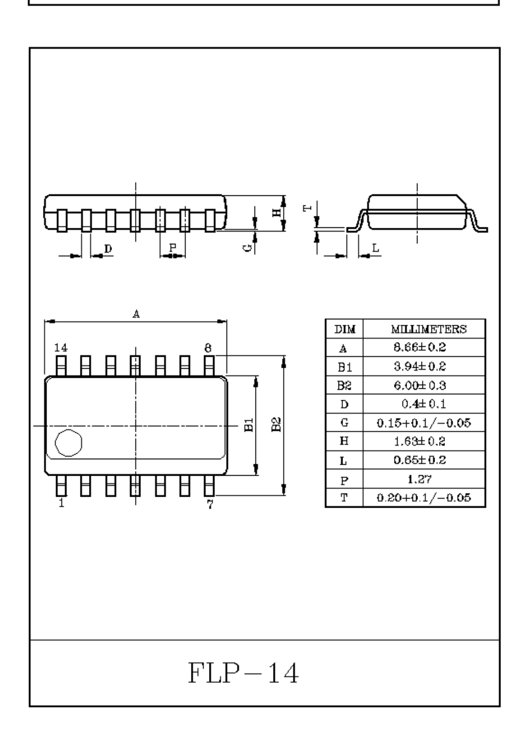
- In the Linear Mode the Input Common Mode Voltage Range Includes Ground.
- Four Internally Compensated OP Amps are in Single Package.
- Low Power Dissipation and Power Drain Suitable for Battery Operation.
- Differential Input Voltage Range Equal to the Power Supply Voltage.
- Wide Power Supply Voltage Range and Signal Power Supply : Single Supply $3V_{DC}$ to $36V_{DC}$
  Dual Supplies $\pm 1.5V_{DC}$ to $\pm 18V_{DC}$.
- Large Output Voltage Swing : $0V_{DC}$ to $V_{CC}-1.5V_{DC}$.
- Low Input Biasing Current : $I_I=45nA_{DC}$ (Typ.).

DIM	MILLIMETERS
A	19.3±0.2
B	6.45±0.2
D	1.52±0.1
d	0.46±0.1
G	0.50 MIN
H	3.8±0.3
L	3.3±0.3
P	2.54
T	0.25+0.1/−0.05
W	7.62
θ	0 − 15°

DIP−14

PIN CONNECTION (TOP VIEW)





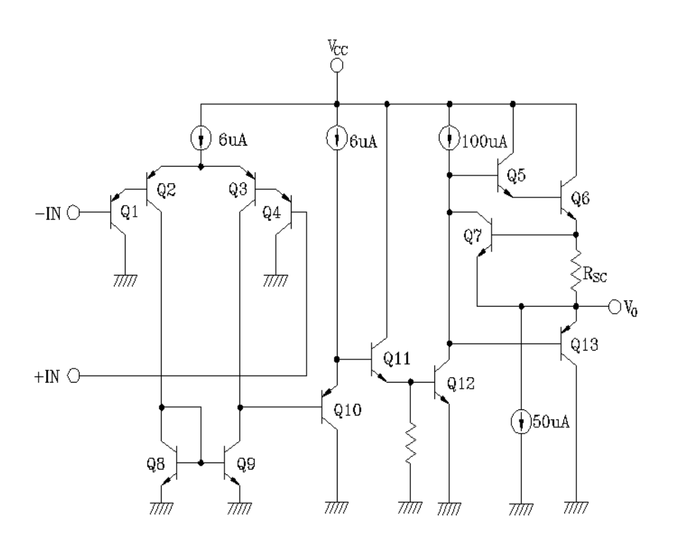
DIM	MILLIMETERS
A	8.66±0.2
B1	3.94±0.2
B2	6.00±0.3
D	0.4±0.1
G	0.15+0.1/−0.05
H	1.63±0.2
L	0.65±0.2
P	1.27
T	0.20+0.1/−0.05

FLP−14

MAXIMUM RATINGS (Ta=25℃)

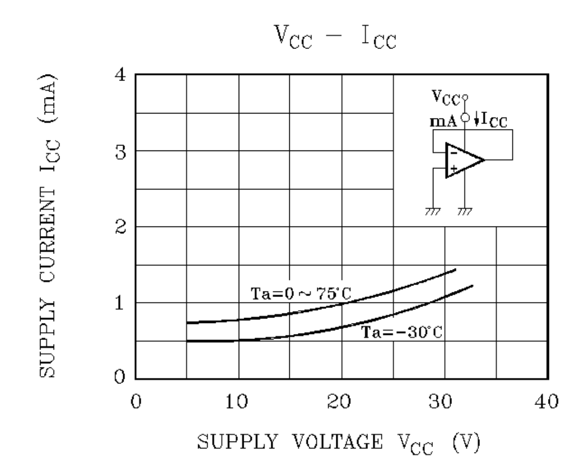
CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	36, +18	V
		V_{EE}	0 , -18	
Differential Input Voltage		DV_{IN}	±36	V
Input Voltage		V_{IN}	-0.3～36	V
Power Dissipation	KIA324P	P_D	625	mW
	KIA324F		280	
Operating Temperature		T_{opr}	-40～85	℃
Storage Temperature		T_{stg}	-55～125	℃

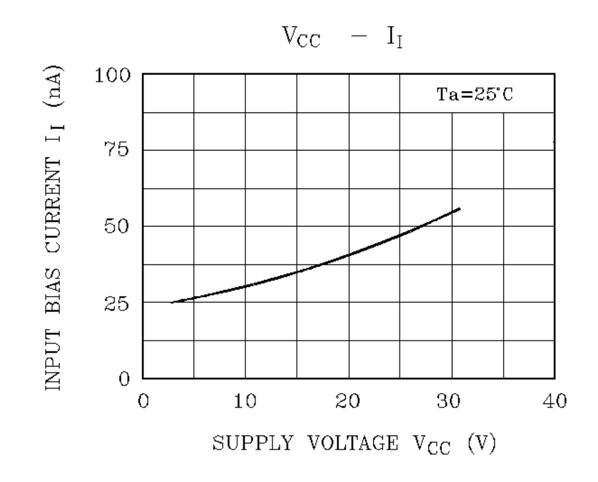
EQUIVALENT CIRCUIT

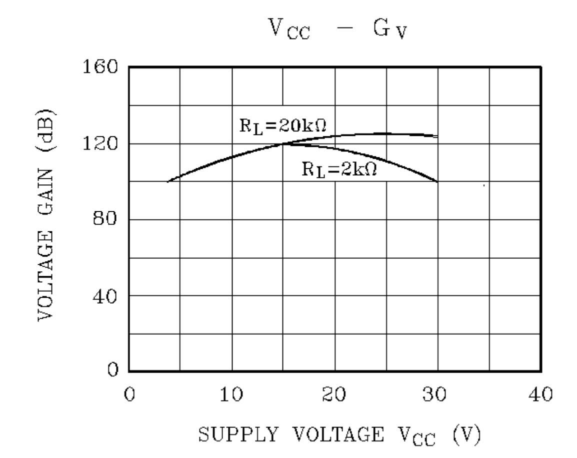


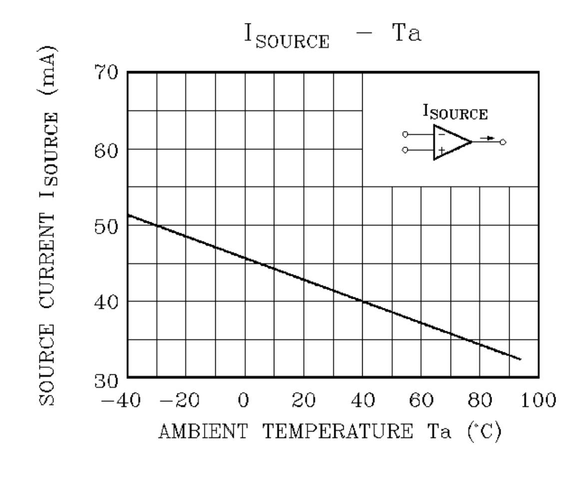
ELECTRICAL CHARACTERISTICS (V_{CC}=5V, V_{EE}=GND, Ta=25℃)

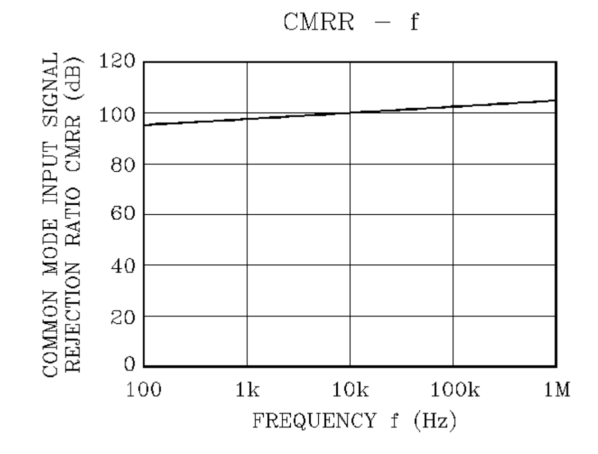
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	Rg≦10kΩ	-	2	7	mV
Input Offset Current	I_{IO}	-	-	5	30	nA
Input Bias Current	I_I	-	-	45	150	nA
Common Mode Input Voltage	CMV_{IN}	V_{CC}=30V, V_{EE}=GND	0	V_{CC}-1.5	-	V
Supply Current	I_{CC}, I_{EE}	R_L=∞, All OP Amps	-	0.7	1.2	mA
Voltage Gain	G_V	R_L≧2kΩ	86	100	-	dB
Maximum Output Voltage Swing	V_{OP-P}	R_L=2kΩ	0	V_{CC}-1.5	-	V
Common Mode Input Signal Rejection Ratio	CMRR	-	60	85	-	dB
Supply Voltage Rejection Ratio	SVRR	Rg=10kΩ	60	100	-	dB
Source Current	I_{source}	-IN=OV_{DC}, +IN=1V_{DC}	20	40	-	mA
Sink Current	I_{sink}	-IN=1V_{DC}, +IN=0V_{DC}	10	20	-	mA

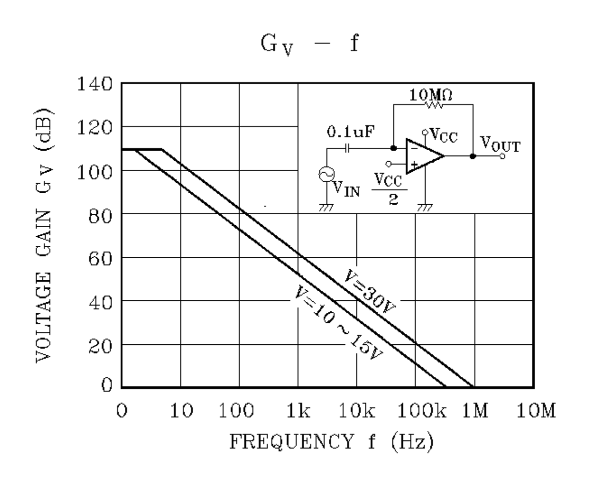

VCC – ICC
SUPPLY CURRENT ICC (mA)
SUPPLY VOLTAGE VCC (V)
Ta=0～75°C
Ta=-30°C
VCC
mA
ICC
0
1
2
3
4
0
10
20
30
40

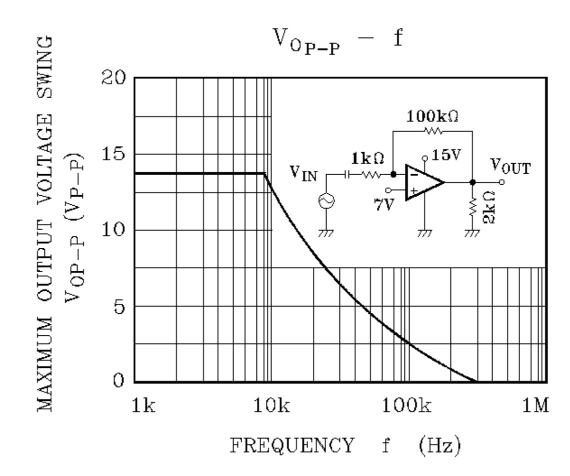

VCC – II
INPUT BIAS CURRENT II (nA)
SUPPLY VOLTAGE VCC (V)
Ta=25°C
0
25
50
75
100
0
10
20
30
40

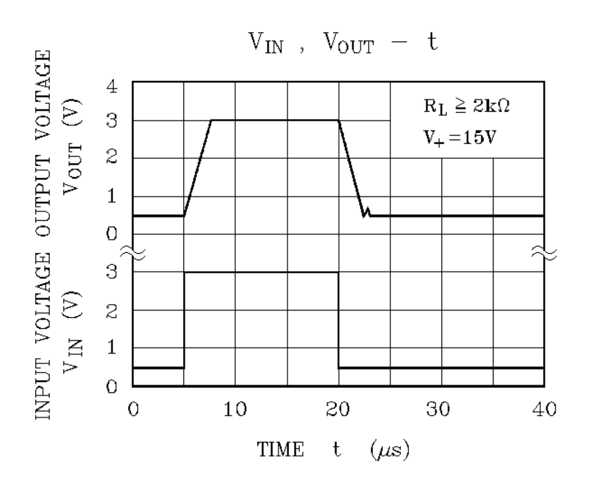

VCC – GV
VOLTAGE GAIN (dB)
SUPPLY VOLTAGE VCC (V)
RL=20kΩ
RL=2kΩ
0
40
80
120
160
0
10
20
30
40

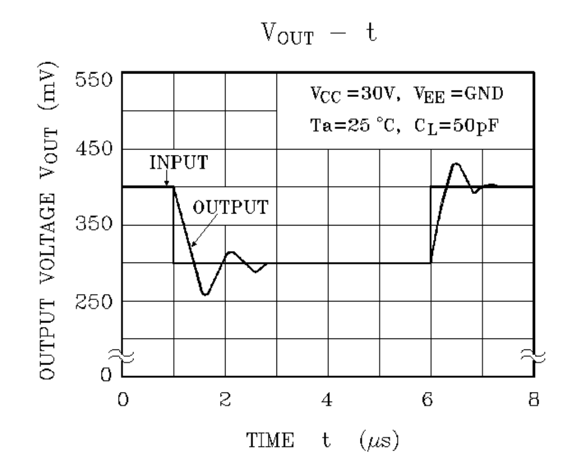

ISOURCE – Ta
SOURCE CURRENT ISOURCE (mA)
AMBIENT TEMPERATURE Ta (°C)
ISOURCE
30
40
50
60
70
-40
-20
0
20
40
60
80
100

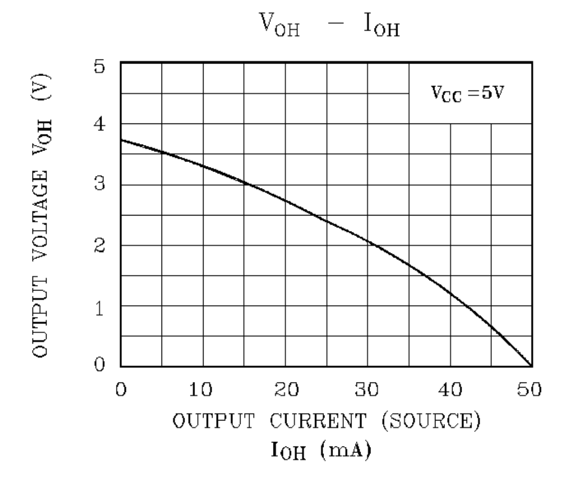

CMRR – f
COMMON MODE INPUT SIGNAL
REJECTION RATIO CMRR (dB)
FREQUENCY f (Hz)
0
20
40
60
80
100
120
100
1k
10k
100k
1M

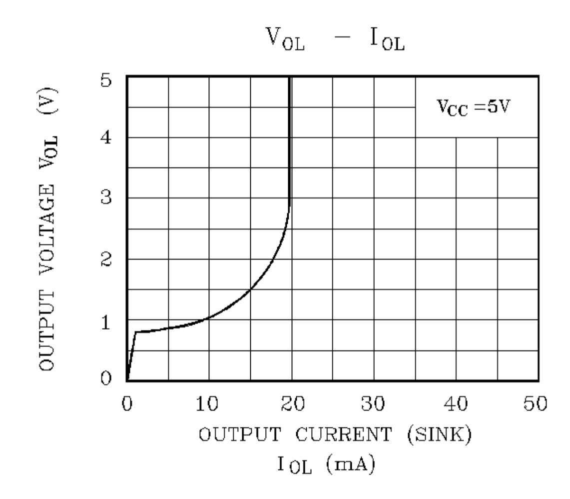

GV – f
VOLTAGE GAIN GV (dB)
FREQUENCY f (Hz)
10MΩ
0.1uF
VCC
VOUT
VIN
VCC/2
V=30V
V=10～15V
0
20
40
60
80
100
120
140
0
10
100
1k
10k
100k
1M
10M


V_{OP-P} – f
MAXIMUM OUTPUT VOLTAGE SWING V_{OP-P} (V_{P-P})
100kΩ
1kΩ
15V
V_{IN}
V_{OUT}
7V
2kΩ
FREQUENCY f (Hz)


V_{IN} , V_{OUT} – t
OUTPUT VOLTAGE V_{OUT} (V)
INPUT VOLTAGE V_{IN} (V)
$R_L \geq 2k\Omega$
$V_+ = 15V$
TIME t (μs)


V_{OUT} – t
OUTPUT VOLTAGE V_{OUT} (mV)
V_{CC} =30V, V_{EE} =GND
Ta=25 °C, C_L=50pF
INPUT
OUTPUT
TIME t (μs)


V_{OH} – I_{OH}
OUTPUT VOLTAGE V_{OH} (V)
V_{CC} =5V
OUTPUT CURRENT (SOURCE)
I_{OH} (mA)


V_{OL} – I_{OL}
OUTPUT VOLTAGE V_{OL} (V)
V_{CC} =5V
OUTPUT CURRENT (SINK)
I_{OL} (mA)